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IN THE

Supreme Court of the United States

OCTOBER TERM, 1986

EDWIN W. EDWARDS, in his official capacity as Governor of Louisiana, *et al.*,

Appellants,

v.

DON AGUILLARD, *et al.*,

Appellees.

On Appeal From the United States Court of Appeals For The Fifth Circuit

AMICUS CURIAE BRIEF OF 72 NOBEL LAUREATES, 17 STATE ACADEMIES OF SCIENCE, AND 7 OTHER SCIENTIFIC ORGANIZATIONS, IN SUPPORT OF APPELLEES†

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August 18, 1986

†The inside front cover provides a complete list of *amici*.

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COMPLETE LIST OF REPRESENTED *AMICI*

Nobel Laureates: Luis W. Alvarez, Carl D. Anderson, Christian B. Anfinsen, Julius Axelrod, David Baltimore, John Bardeen, Paul Berg, Hans A. Bethe, Konrad Bloch, Nicolaas Bloembergen, Michael S. Brown, Herbert C. Brown, Melvin Calvin, S. Chandrasekhar, Leon N. Cooper, Allan Cormack, André Cournand, Francis Crick, Renato Dulbecco, Leo Esaki, Val L. Fitch, William A. Fowler, Murray Gell-Mann, Ivar Giaever, Walter Gilbert, Donald A. Glaser, Sheldon Lee Glashow, Joseph L. Goldstein, Roger Guillemin, Roald Hoffmann, Robert Hofstadter, Robert W. Holley, David H. Hubel, Charles B. Huggins, H. Gobind Khorana, Arthur Kornberg, Polykarp Kusch, Willis E. Lamb, Jr., William Lipscomb, Salvador E. Luria, Barbara McClintock, Bruce Merrifield, Robert S. Mulliken, Daniel Nathans, Marshall Nirenberg, John H. Northrop, Severo Ochoa, George E. Palade, Linus Pauling, Arno A. Penzias, Edward M. Purcell, Isidor I. Rabi, Burton Richter, Frederick Robbins, J. Robert Schrieffer, Glenn T. Seaborg, Emilio Segré, Hamilton O. Smith, George D. Snell, Roger Sperry, Henry Taube, Howard M. Temin, Samuel C. C. Ting, Charles H. Townes, James D. Watson, Steven Weinberg, Thomas H. Weller, Eugene P. Wigner, Kenneth G. Wilson, Robert W. Wilson, Rosalyn Yalow, Chen Ning Yang.

State Academies of Science: The California Academy of Sciences, The Florida Academy of Sciences, The Idaho Academy of Science, The Indiana Academy of Science, The Iowa Academy of Science, The Kentucky Academy of Science, The Mississippi Academy of Sciences, The Nebraska Academy of Sciences, The New Mexico Academy of Science, The New York Academy of Sciences, The North Dakota Academy of Science, The Ohio Academy of Science, The South Carolina Academy of Science, The Tennessee Academy of Science, the Vermont Academy of Arts and Sciences, The West Virginia Academy of Sciences, The Wisconsin Academy of Sciences, Arts and Letters.

Other Scientific Organizations: The American Anthropological Association, The American Institute of Biological Sciences, The Association of American Medical Colleges, The Astronomical Society of the Pacific, The Committee for the Scientific Investigation of Claims of the Paranormal, The Southern California Skeptics, The Southern California Academy of Sciences.

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INTEREST OF *AMICI CURAE*

Amici curiae are individual scientists, state academies of science, and other scientific organizations. Each of the 72 individual *amici* has received the Nobel Prize in Physics,[1] in

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[1] U S NOBEL LAUREATES IN PHYSICS

Name	Year	Field of Study
S. Chandrasekhar & William A. Fowler	1983	Investigations concerning stellar evolution
Kenneth G. Wilson	1982	Theory of phase transitions
Nicolaas Bloembergen	1981	Advances in technological applications of lasers for the study of matter
Val L. Fitch	1980	Studies showing "charge-parity" and time symmetry could be violated

Chemistry, [2] or in Physiology or Medicine.[3]

Sheldon Lee Glashow & Steven Weinberg	1979	Link between electromagnetism and the weak force of radioactive decay
Arno A. Penzias & Robert W. Wilson	1978	Discovery of microwave radiation from the Big Bang
Burton Richter & Samuel C. C. Ting	1976	Parallel discovery of subatomic particle that established the existence of charm
Leo Esaki & Ivar Giaever	1973	Theories on superconductors & semiconductors important to microelectronics
John Bardeen, Leon N. Cooper & J. Robert Schrieffer	1972	Theory of superconductivity without electrical resistance at temperature of absolute zero
Murray Gell-Mann	1969	Classification of elementary particles
Luis W. Alvarez	1968	Discovery of "resonance" particles
Hans A. Bethe	1967	Study of energy production of stars
Charles H. Townes	1964	Development of maser and laser principles in quantum mechanics
Robert Hofstadter	1961	Hofstadter's measure of nucleons
Donald A. Glaser	1960	Bubble chamber for subatomic study
Emilio Segré	1959	Demonstration of the existence of the antiproton
Chen Ning Yang	1957	Discovery of violations of law of conservation of parity
John Bardeen	1956	Studies on semiconductors and invention of electronic transistor
Polykarp Kusch	1955	Magnetic momentum of electron
Willis E. Lamb, Jr.	1955	Measurement of hydrogen spectrum
Edward M. Purcell	1952	Measurement of magnetic moment of neutron
Isadore I. Rabi	1944	Magnetic properties of molecular beams
Carl D. Anderson	1936	Discovery of the positron

[2] U.S. NOBEL LAUREATES IN CHEMISTRY

Name	Year	Field of Study
Bruce Merrifield	1984	Chemical synthesis on solid supports
Henry Taube	1983	New discoveries in basic mechanism of chemical reactions
Roald Hoffman	1981	Application of laws of quantum mechanics to chemical reactions
Paul Berg	1980	Development of recombinant DNA

Walter Gilbert	1980	Development of methods to map the structure of DNA
Herbert C. Brown	1979	Study of boron-containing organic compounds
William Lipscomb	1976	Study of bonding in boranes
Christian B. Anfinsen	1972	Protein structure and function
Robert S. Mulliken	1966	Study of atomic bonds in molecules
Melvin Calvin	1961	Work in chemistry of photosynthesis
Linus Pauling	1954	Work on chemical bonds
Glenn T. Seaborg	1951	Discovery of plutonium and research on transuranium elements
John H. Northrop	1946	Crystallization of enzymes

[3] U.S. NOBEL LAUREATES IN PHYSIOLOGY OR MEDICINE

Name	Year	Field of Study
Michael S. Brown & Joseph L. Goldstein	1985	Discovery of receptors that control body cholesterol
Barbara McClintock	1983	Discovery of mobile genes in chromosomes of corn
David H. Hubel & Roger Sperry	1981	Studies on the organization and local functions of brain areas
George D. Snell	1980	Discovery of the role of antigens in organ transplants
Allan Cormack	1979	Invention of computerized axial tomography (CAT scan)
Daniel Nathans & Hamilton O. Smith	1978	Discovery and use of restriction enzymes for DNA
Roger Guillemin	1977	Discovery and molecular structures of brain hormones
Rosalyn Yalow	1977	Development of radioimmunoassays of peptide hormones
David Baltimore, Renato Dulbecco & Howard M. Temin	1975	Discovery of reverse transcriptase and work with the interaction between viruses and host cells
George E. Palade	1974	Analysis of structure, chemistry and function of cell organelles
Julius Axelrod	1970	Discoveries in the chemical transmission of nerve impulses
Salvador E. Luria	1969	Discoveries in the workings and reproduction of viruses

This case is crucial to the future of scientific education in this nation. As researchers in many different branches of advanced science, *amici* share a concern for the basic scientific education of this nation's public-school students. Scientific education should accurately portray the current state of substantive scientific knowledge. Even more importantly, scientific education should accurately portray the premises and processes of science. Teaching religious ideas mislabeled as science is detrimental to scientific education: It sets up a false conflict between science and religion, misleads our youth about the nature of scientific inquiry, and thereby compromises our ability to respond to the problems of an increasingly technological world. Our capacity to cope with problems of food production, health care, and even national defense will be jeopardized if we deliberately strip our citizens of the power to distinguish between the phenomena of nature and supernatural articles of faith. "Creation-science" simply has no place in the public-school science classroom. *Amici* urge this Court to affirm the Court of Appeals' judgment that the Louisiana statute is unconstitutional.

Counsel for both parties have consented to the filing of this brief. Letters of consent are on file with the clerk.

Robert W. Holley, H. Gobind Khorana & Marshall Nirenberg	1968	Understanding and deciphering the genetic code that determines cell function
Charles B. Huggins	1966	Research on causes and treatment of cancer
Konrad Bloch	1964	Work on cholesterol and fatty acid metabolism
Francis Crick & James D. Watson	1962	Determination of molecular structure of DNA
Arthur Kornberg & Severo Ochoa	1959	Artificial production of nucleic acids with enzymes
André Cournand	1956	Use of catheter for study of the interior of the heart and circulatory system
Frederick Robbins & Thomas H. Weller	1954	Discovery of a method of cultivating viruses in tissue culture

SUMMARY OF ARGUMENT

The Louisiana Balanced Treatment for Creation-Science and Evolution-Science Act (the "Act") violates the Establishment Clause, as incorporated in the Fourteenth Amendment. The Act's illegitimate bias toward the outlook of a particular religious sect is reflected in two separate provisions. One calls for the presentation of the religious tenets of "creation-science" in public-school science classes. The other singles out the domain of evolutionary science for special pejorative treatment.

The Act mandates "balanced treatment" of evolution and "creation-science," but contains no definition of "creation-science" beyond a tautological reference to "scientific evidences of creation." Orthodox "creation-science" has traditionally embraced religious tenets, most notably: divine creation "from nothing," distinct "kinds" of plants and animals, a worldwide flood, and a relatively recent inception of the universe. In their brief, appellants deny that the statutory term "creation-science" reflects those religious tenets; instead, appellants insist upon a sterilized alternative: the evidence for "abrupt appearance in complex form." Nevertheless, for four different reasons, appellants' abrupt-appearance construct must be rejected as a post hoc invention that misdefines the term "creation-science" as used in the Act.

First, the legislative history includes citations both to specifically recommended books for teachers and to significant publishers of creation-science material. All the recommended books and all other creation-science publications by those publishers present orthodox creation-science. Second, appellants' abrupt-appearance construct is not sufficiently well-defined to plausibly have been the Louisiana legislature's intended meaning. At times appellants quote the use of the word "abrupt" by respected scientists, even though those scientists use the term to describe periods of hundreds or thousands of years. Either appellants are badly misusing those authorities or they are suggesting the indefensible proposition that the Louisiana legislature intended teachers to

present a balanced treatment of *evolution* and evolution. Third, Louisiana law requires a term of art to be given its "received meaning and acceptation" among the specialists who use it. The published works of those who call themselves creation-scientists uniformly employ "creation-science" to mean orthodox creation-science; indeed, we have not been able to unearth a single book setting forth appellants' sterilized abrupt-appearance construct. Finally, it is well established that this Court normally defers to the lower federal courts' construction of state statutes. Neither the District Court nor the Court of Appeals in this case accepted the appellants' construction of the term "creation-science." In sum, all relevant guides to the Act's meaning confirm that it calls for the religious tenets of orthodox creation-science to be taught in the public schools.

The Act's unconstitutional purpose is also evident in its requirement that both "creation-science" and "evolution-science" be taught as "theory" and not as "proven scientific fact." To a scientist or a science educator, the distinction between scientific theories and scientific facts is well understood. A "fact" is a property of a natural phenomenon. A "theory" is a naturalistic explanation for a body of facts. That distinction permeates all fields of scientific endeavor. It is no more relevant to discussions of the origin of the universe and life than to any other area of research. By singling out one topic in science — "origins" — for special treatment, the legislature conveys the false message that the prevailing theory of "origins" — evolutionary theory — is less robust and reliable than all other scientific concepts. This misleadingly disparaging treatment of evolution confirms that the Act favors a particular religious belief.

ARGUMENT

I. The Term "Creation-Science" in the Act Embodies Religious Dogma, Not the Sterilized "Abrupt-Appearance" Construct Propounded by Appellants in this Litigation

The Constitution permits public-school teachers to inculcate values, to describe religions and religious communities, and to explain that some people reject certain

scientific concepts as a matter of religious faith. However, the Constitution prohibits public-school teachers from endorsing substantive religious dogma, even as one view among others. That prohibition cannot be evaded merely by re-labeling the religious ideas as science. Consequently, the Louisiana legislature may not mandate "balanced treatment" of evolution and "creation-science" if what it actually means by "creation-science" is religious dogma.

The District Court held that, beneath the labels, the terms "creation" and "creation-science" embody the principles of a particular religious sect or group of sects. *Aguillard* v. *Treen*, No. 81-4787, slip op. at 5 (E.D. La. Jan. 10, 1985). It concluded that the legislature intended Louisiana's public-school teachers to offer students evidence that mankind and the universe were brought into existence by a divine Creator. *Id.* The Court of Appeals affirmed, agreeing that the statute called for teachers to balance evolution against a religious belief. *Aguillard* v. *Edwards*, 765 F.2d 1251 (5th Cir. 1985).

A review of the lower courts' determinations requires an appreciation of the meaning of "creation-science." The "creation-science" account of the origin of living things and the universe is derived from the Book of Genesis. As understood by its promoters and adherents, "orthodox creation-science," as we shall denominate it, includes the following four key tenets:

(1) that a divine Creator created the world "from nothing" ("*ex nihilo*"),

(2) that the Creator fashioned distinct "kinds" (or "types") of plants and animals that cannot give rise to new "kinds,"

(3) that a "worldwide flood" or "Deluge" formed fossils and other paleontological and geological phenomena, and

(4) that the universe had a "relatively recent inception" (within the past 10,000 years).[4]

[4] These four tenets are enumerated, among other places, in *McLean* v. *Arkansas Board of Education*, 529 F. Supp. 1255, 1264 (E.D. Ark.

The dependency of those concepts upon a particular religious outlook is exceptionally well-documented in the opinion and record in *McLean*, 529 F. Supp. at 1264-69.

Appellants offer no reason to doubt that orthodox creation-science is religious dogma; instead, their brief takes pains to deny that the term "creation-science" in the Act means orthodox creation-science.[5] Appellants assert that the term "creation-science" in the Act has a sterilized meaning: "origin through abrupt appearance in complex form of biological life, life itself, and the physical universe." App. Br. 15. They contend that the legislative purpose was benign because the legislators passed a statute incorporating this "abrupt-appearance" construct.

1982) (quoting the Arkansas statute struck down in that case); *Distinction Between Scientific Creationism and Biblical Creationism*, Acts & Facts 4 (December 1978) (setting forth Wendell R. Bird's summary of the model); and Morris, *The Tenets of Creationism*, Impact, July 1980, at ii. Impact and Acts & Facts are published by the Institute for Creation Research. Although these particular articles distinguish "Scientific Creationism" from "Biblical Creationism," the tenets of both types of creationism include the four listed above. Impact, *supra*, at ii-iv; Acts & Facts, *supra*, at 4.

In many creation-science publications it is impossible to find an explication of the creation-science model. Those publications, rather than building an affirmative case for creation, concentrate solely on attempting to discredit evolution. The "scientific" arguments used to discredit evolution are often included as basic tenets of creation-science. *See, e.g.*, Pro Family Forum materials at 13, Exhibit A-5 to Pfeffer Affidavit ("Ex. A-5") ("[t]he mathematical chance of random mutation and natural selection producing one kind from another is vanishingly small, so mutation and selection could not have produced progressive evolution," and "[t]he second law of thermodynamics says things generally go from order to disorder, so simple living kinds could not have evolved by mutation and selection into complex living kinds"). These arguments, however, are all badly flawed. *See, e.g.*, Freske, *Creationist Misunderstanding, Misrepresentation, and Misuse of the Second Law of Thermodynamics*, 6 Creation/Evolution 8 (Spring 1981).

[5] "There are several *misconceptions* about creation-science. It does *not* essentially involve creation 'from nothing,' 'kinds' of plants or animals, 'catastrophism' or a 'worldwide flood,' or a 'relatively recent inception of the universe and life.'" Brief for Appellants ("App. Br.") at 14 n.52 (emphasis in original). *Accord id.* at 40.

This claim as to the meaning of the term "creation-science" is the heart of appellants' case. Since the choice between two alternative interpretations of a statute is a question of law, *Trust of Bingham* v. *Commissioner of Internal Revenue*, 325 U.S. 365, 371 (1945), the views of appellants' affiants raise no triable issues of fact, and summary judgment is appropriate. In the balance of this section we shall demonstrate that the judgment below should be affirmed on the ground that the term "creation-science" in the Act means orthodox creation-science.

A. The Legislative Record Demonstrates that the Term "Creation-Science" in the Act Refers to Orthodox Creation-Science, Not the Abrupt-Appearance Construct

If appellants were correct that the Act mandates the teaching of the abrupt-appearance construct rather than orthodox creation-science, one would expect to find some hint of that critical distinction in the legislative record. Yet the examples of creation-science offered to the legislators were all examples of orthodox creation-science.

The most extensive analysis of the term "creation-science" was offered by the Pro Family Forum. That group presented testimony to the Louisiana legislature urging adoption of the Act. They also provided a written Summary of Scientific Evidence for Creation, which identified the following basic tenets of "creation-science": an "explanation of the earth's geology by a world-wide flood," the "relatively recent inception of the earth and living kinds," and the "fixity of original plant and animal kinds."[6] Those are the very tenets of orthodox creation-science that appellants deny are to be taught under the Act. The Pro Family Forum went on

[6] Pro Family Forum materials at 13-14, Ex. A-5. Edward Boudreaux's statement also refers to a young earth, a worldwide flood and a supernatural Creator. Boudreaux statement at 6, 9, Ex. A-5. Both the Pro Family Forum and Boudreaux also advance the usual anti-evolution arguments made by orthodox creation-scientists. *See* note 4 *supra*.

to identify seven books as appropriate to give teachers the necessary background to teach "creation-science."[7] These books embody the tenets of orthodox creation-science.

The first book on the list is *A Search for Order*. The book is a high-school biology text, designed for use in Christian and public schools,[8] and was published by the Creation Research Society ("CRS"). While CRS members generally hold degrees in science, in order to become full members they must subscribe to an explicitly Christian "statement of belief."[9] It is

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[7] *Biology: A Search for Order in Complexity* (J. Moore & H. Slusher eds. 1970) ("*A Search for Order*"); D. Gish, *Evolution: The Fossils Say No!* (3d ed. 1979) ("*Fossils Say No*"); R. Bliss, *Origins: Two Models* (1978) ("*Two Models*"); R. Bliss & G. Parker, *Origin of Life* (1979) ("*Origin of Life*"); H. Morris, *Scientific Creationism* (pub. sch. ed. 1974) ("*Scientific Creationism*"); A. Hyma & M. Stanton, *Streams of Civilization* (Vol. 1, 1976) ("*Streams 1*"); and R. Clouse and R. Pierard, *Streams of Civilization* (Vol. 2, 1980) ("*Streams 2*"). The list also identified teachers' guides, laboratory manuals, and other teaching aides.

[8] The book was designed for use in the public schools, *A Search for Order*, *supra* note 7, at xx, but when an Indiana public school attempted to use it, a state court judge held that its use would violate the Establishment Clause, *Hendren* v. *Campbell*, (Superior Court No. 5, Marion County, Indiana) (April 14, 1977), *reprinted in* National Association of Biology Teachers, *A Compendium of Information on the Theory of Evolution and the Evolution-Creationism Controversy* 31 (rev. ed. 1978).

[9] (1) The Bible is the written Word of God . . . all of its assertions are historically and scientifically true in all of the original autographs. . . . [T]his means that the account of origins in Genesis is a factual presentation of simple historical truths. (2) All basic types of living things, including man, were made by direct creative acts of God during Creation Week as described in Genesis. Whatever biological changes have occurred since Creation have accomplished only changes within the original created kinds. (3) The great Flood described in Genesis, commonly referred to as the Noachian Deluge, was an historical event, worldwide in its extent and effect. (4) Finally, we are an organization of Christian men of science, who accept Jesus Christ as our Lord and Savior. The account of the special creation of Adam and Eve as one man and one woman, and their subsequent Fall into sin, is the basis for our belief in the necessity of a Savior for all mankind. Therefore, salvation can come only thru [sic] accepting Jesus Christ as our Savior.

McLean, 529 F. Supp. at 1260 n.7 (quoting application for membership in CRS).

therefore not surprising that *A Search for Order* offers a traditional exposition of orthodox creation-science. The body of the book is replete with references to "kinds" of plants and animals,[10] a worldwide flood,[11] and a young earth.[12] Indeed, it identifies creation-science with a literal reading of Genesis.[13]

The remaining six books on the Pro Family Forum's reading list for teachers are published by the Institute for Creation Research ("ICR"). ". . . ICR, through the Creation-Life Publishing Company [and its Master Books division], is the leading publisher of creation science material." *McLean*, 529 F. Supp. at 1259. ICR considers itself a "fully creationist and Biblically evangelical institution," H. Morris, *Evolution in Turmoil* 117 (1982), whose "ministry" includes the introduction of creation-science into the public-school curriculum. *McLean*, 529 F. Supp. at 1260. To the extent each ICR book mentioned in the Pro Family Forum's reading list presents "creation-science," its discussion includes one or more of the basic tenets of orthodox creation-science.[14]

McLean, 529 F. Supp. at 1260 n.7 (quoting application for membership in CRS).

[10] *E.g.*, *A Search for Order*, *supra* note 7, at 422 ("Creationists believe that when God created the vertebrates, He used a single blueprint for the body plan but varied the plan so that each 'kind' would be perfectly equipped to take its place in the wonderful world He created for them"); *id.* at 430.

[11] *E.g.*, *id.* at 405 ("the fact that most fossil material was laid down by the flood in Noah's time"); *id.* at 412, 418.

[12] *E.g.*, *id.* at 416 ("Most creationists believe that the age of the earth can be measured in thousands rather than millions or billions of years.").

[13] *E.g.*, *id.* at 419 ("[C]reationists have confirmation of a major prediction based upon the Genesis account of creation.").

[14] *See, e.g.*, *Scientific Creationism*, *supra* note 7, at 17 ("Not only the matter and energy of the cosmos, but also the laws controlling their behaviour, were specially created *ex nihilo*, or perhaps better, *ex Deo*"); *id.* at 88 ("while there may have been many changes within the kinds . . . , the kinds have apparently not varied since the beginning, except for those that have become extinct"); *id.* at 92 ("the creation model is fundamentally catastrophic"); *id.* at 111 ("The creation model, on the other hand, must interpret the [geologic] column in terms of essentially continuous deposition, all accomplished in a relatively short

Moreover, several of the books contain direct or thinly veiled references to the Book of Genesis.[15]

time"); *Origin of Life*, *supra* note 7, at 7 ("this ordering process requires and reflects the special acts of an intelligent Creator"); *Two Models*, *supra* note 7, at 31 ("all living things originated from basic ***kinds*** of life, each of which was separately created") (bold in original); *id.* at 36 ("Creationists consider most of the vast sedimentary layers of rock covering the earth today to have been deposited by a flood"); *id.* at 51 ("[A creation scientist] noted that this mathematical curve showed that the earth could not be over 10,000 years old"); *Fossils Say No*, *supra* note 7, at 42 ("the creation by God of the plants and animals, each commanded to reproduce after its own kind using processes which were essentially instantaneous"); *id.* ("The variation that has occurred since the end of the creative work of God has been limited to changes within kinds"); *id.* at 61 ("It is believed that most of the important geological formations of the earth can be explained as having been formed as a result of the worldwide Noachian Flood"); *id.* at 60 ("Furthermore, the genealogies listed in Genesis . . . would restrict the time of creation to somewhere between six thousand and about ten thousand years ago"); *Streams 1*, *supra* note 7, at 13 ("The creation model defines a period of Special Creation [when] all the stars and planets, all the plants and animals, and the first man and woman were supernaturally created by God"); *id.* at 13 ("The creationist believes, however, that it is not possible for one living thing to evolve into a completely different kind of organism"); *id.* at 24 ("Most modern scientific creationists believe that the flood is a better explanation for the great fossil beds"); *id.* at 24-25 ("creationists believe the evidence indicates human tribes and nations are only several thousand years old"); *id.* at 27 ("Most creationists believe that the dinosaurs were directly created at the same time as men, so that the humans and dinosaurs did live together for many years. However, they believe most of the dinosaurs died in the great Flood."). *Streams 2*, like *Streams 1*, is a history text; all the discussion of creation is in volume 1.

[15] *See, e.g.*, *Fossils Say No*, *supra* note 7, at 42 ("By creation we mean the bringing into being of the basic kinds of plants and animals by the process of sudden, or fiat, creation described in the first two chapters of Genesis"); *Streams 1*, *supra* note 7, at 24 ("The most complete record of the flood, and the one evidently least changed by later word-of-mouth transmission, is the one found in the book of Genesis, in the Hebrew Bible"); *id.* ("As human populations grew, their wickedness became so great that God finally had to destroy them all with the great flood. Only the patriarch Noah and his family survived the flood, in a great vessel built by him at God's direction."); *Scientific Creationism*, *supra* note 7, at 117 ("Visualize, then, a great hydraulic cataclysm bursting upon the present world, with currents of waters pouring perpetually from the skies and erupting continuously from the earth's

The Pro Family Forum statement is not the only indication in the legislative record that the works of ICR are an authoritative guide to the meaning of the term "creation-science" as used in the Act. The Act's sponsor, Senator Keith, had previously singled out ICR as a significant organization of "creation scientists." Ex. A-6 at 29.

The ICR's list of creation-science publications goes beyond those selected by the Pro Family Forum as appropriate reading for public-school teachers.[16] We have reviewed the ICR books relating to creation-science currently available through its publishing arm Master Books. Where the catalog synopsis of a book clearly indicated that it was devoted to a Biblical presentation of creation-science, we did not obtain it. We examined all those books whose synopses indicated that they might set forth a positive model of non-Biblical creation-science. Each book that we examined presents orthodox creation-science.[17] No book that we examined (and, for that

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crust, all over the world, for weeks on end, until the entire globe was submerged. . . . [U]nless a few [humans] managed to ride out the cataclysm in unusually strong watertight sea-going vessels, they would eventually all drown or otherwise perish."); *id.* at 187-88 ("In the creation model, the various tribes and languages all stemmed from one ancestral population that had developed from a remnant that survived the worldwide flood, which is an integral part of the creation-cataclysm model of earth history. They had been forced to break into a number of small sub-populations by the Creator's direct creative restructuring of their common language into many languages.").

[16] In light of his earlier reference to ICR and ICR's role as a major creationist textbook publisher, Senator Keith was undoubtedly referring to ICR publications when he told his fellow legislators that "there is a wealth of scientific materials that are available to any person who will pursue the discipline of scientific creationism." Ex. A-8 at 13.

[17] To be sure, not all of the four tenets are presented in each book, since the books do not all purport to be exhaustive. Every single one, however, refers to at least one of the four tenets. *See, e.g.*, H. Morris, *The Troubled Waters of Evolution* (2d ed. 1982) at 103 (divine Creator); *id.* at 86 ("kinds"); *id.* at 93 ("catastrophism"); H. Morris & G. Parker, *What is Creation Science?* (pub. sch. ed. 1982) at xii (divine

matter, no book cited by appellants) presents the sterilized abrupt-appearance construct.

Creator); *id.* at 190 ("types"); *id.* at 196 ("recent creation and catastrophism"); H. Morris, *Evolution in Turmoil* (1982) at 53 (divine Creator); *id.* at 63 ("the Genesis kinds"); *id.* at 161 ("both a young earth and a worldwide flood . . . but they . . . do not need to be tied to the basic creation/evolution issue, as far as public schools are concerned"); G. Parker, *Creation — The Facts of Life* (1980) at 134 (divine Creator); *id.* at 75 ("created kinds"); *id.* at 126 ("Massive flooding of the continents has always been an important part of creationist geology"); *id.* at 118 (young earth / dinosaurs with humans); H. Morris, *The Remarkable Birth of Planet Earth* (1972) at 36 ("creation out of nothing except God's own power"); *id.* at 41 ("basic kinds"); *id.* at 23 ("the great Flood of the days of Noah"); *id.* at vi-vii ("the earth is very young"); D. Gish, *Evolution: Challenge of the Fossil Record* (1985) at 35 ("creation by God"); *id.* ("the basic kinds"); *id.* at 50 ("Noachian Flood"); H. Morris, *The Scientific Case for Creationism* (1977) at Foreword ("recent, supernatural creation of the universe and all its basic components by a transcendent Creator"; "a recent worldwide flood"); *id.* at 29 ("the basic kinds"); A. Snelling *et al.*, *Casebook I: The Case Against Evolution, The Case for Creation* (1984) at 8 ("intelligent designer"); *id.* ("kinds"); *id.* at 9 ("Noah's Flood"); *id.* at 5 ("a young age for the earth"); G. Parker, *Dry Bones . . . and Other Fossils* (1979) at 68 ("If there is no Creator, then creation doesn't make any sense"); *id.* at 62 ("kinds"); *id.* at 51 ("the Flood"); *id.* at 57 ("if you didn't believe in God, you would probably have to believe fossils are very old"); K. Ernst, *Fossils, Frogs, Fish and Friends* (1984) at 2 ("Creator"); *id.* at 23 ("many created kinds of animals died in a flood"); H. Rue, *Bomby the Bombardier Beetle* (1984) at 31 ("God's big plan"); J. Moore, *How to Teach Origins (Without ACLU Interference)* (1983) at 129 ("Eternal Creator"); *id.* at 202 ("the terms *kinds, forms, and types* are really interchangeable terms") (emphasis in original); *id.* at 202 ("catastrophic flood"); *id.* at 233 ("a maximum age of the earth is calculated to be 10,000 years B.P."); W. Rusch, *The Argument: Creationism vs. Evolutionism* (1984) at 26-27 ("a Creator, an all-powerful Being"; "the ability to vary . . . only within the framework of the kind"); Z. Levitt, *Creation: A Scientist's Choice* (1976) at 37 ("only after their kinds, as we find in the Genesis account (1:11-2:27)"); *id.* ("[f]or the Flood (Gen. 7:10-8:3), the third element of the creation model, we have no such observable evidence"); *id.* at 40 ("God may have created an earth with the appearance of age, but He created it relatively recently"); H. Morris, *The Twilight of Evolution* (2d ed. 1982) at 42 ("the Genesis account of creation"; "The only biological unit identified therein is called a *kind*") (emphasis in original); *id.* at 65 ("the divinely inspired record of the flood in the Bible is corroborated by hundreds of reflections of this same great event handed down in the legends and historical

To be sure, parts of the legislative history signal an awareness by the sponsors that direct allusions to the tenets of orthodox creation-science would advertise the unconstitutionality of the Act. The language of the original bill was substantially identical to that of an Arkansas statute, defining the phrase "the scientific evidences for creation and inferences from those scientific evidences" to include the four basic tenets of orthodox creation-science. S. B. 86 § 3704(1), reprinted in Ex. A-7 at 4. On May 27, 1981, the suit that caused the Arkansas statute to be held unconstitutional was filed. *McLean*, 529 F. Supp. at 1256-57. The next day, that fact was called to the attention of the Senate Committee on Education. Ex. A-9 at 10. After hearing further testimony, Senator Byres asked the Committee to delete the list of tenets, stating that the deletion was "intended to try to produce some good for the bill and not intended to try to gut it in any way, or defeat the purpose [for] which Senator Keith introduced his bill." Ex. A-9 at 16.

Appellants suggest that the litany of orthodox creation-science tenets was excised not to hide the clearly religious character of "creation-science" but rather to ensure that "incorrect" illustrations of creation-science not be provided.[18]

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records of practically all nations and tribes in the earth. It is eminently scientific and reasonable, therefore, to consider with full seriousness the proposition that the fossil record may be in large measure a record of the effects of the Noahic flood."); *id.* at 56 ("true creation *necessarily* involves creation of an 'appearance of age.'") (emphasis in original); R. L. Wysong, *The Creation-Evolution Controversy* (1984) at 145 ("the universe is youthful and life dates back only a few thousand years").

[18] Appellants quote Senator Byre's statement that "maybe there are some things in here that ought not have been included" to support their assertion that the legislators understood the illustrations to be "incorrect." App. Br. 40. The full context of that statement, however, does not support appellants' interpretation. Rather, Senator Byres objected to the inclusion of any sort of "all inclusive list":

> I don't know personally why all of those things are or should be included in the law, I think they ought to be excluded from it. Senator Keith seems to agree with me and certainly I have no experience and no knowledge as to whether this should be [the] all inclusive list. Maybe there are some things that are not included on here that some person smarter than

App. Br. 40 & n.186. If that suggestion were accurate, one would surely expect to find somewhere in the legislative record an explicit directive that teachers *not* advocate those tenets, given their centrality in all of the creation-science writings referred to in that record. And one would also expect to find some reference to the supposed alternative, the abrupt-appearance construct. Yet neither expectation is fulfilled. Indeed, on the same day that the Senate Committee on Education removed the elaboration of orthodox creation-science from the text of the statute, Senator Keith referred directly to the concept of a "young earth" in his summary statement to the Committee on "what creation is":

> [A] study of the earth's magnetic field unequivocably proves that *the earth is not nearly old enough* to have accommodated all the concepts that scientists have told to us about evolution . . . .

Ex. A-9 at 15 (emphasis added).[19]

> us would have thought of that should have been included, maybe there are some things in here that ought not have been included. I don't know. Whoever drafted the bill evidently had this list and put these in, my amendments would strike those out. I don't think it does any violence to the bill.

Ex. A-9 at 18.

[19] At page 40 of their brief, appellants quote Senator Keith's speech in describing the material "of which creation science consists" but replace the above language with ellipses.

In the portion of Senator Keith's statement set forth in appellants' brief, he states that "the second law of thermodynamics points to creation," "biogenesis effectively kills the concept of evolution," evolution is a "mathematical impossibility," and "the fossil record points to creation." *Id.* Here Senator Keith refers not to any affirmative principles of creation-science, but rather to the typical flawed anti-evolution arguments used by orthodox creation-scientists. *See* note 4 *supra*. As can be seen from an examination of the published works of orthodox creation-scientists, these very anti-evolution arguments are traditionally used to support the orthodox creation-science model. *See, e.g.*, H. Morris, *Scientific Creationism* 59-90 (pub. sch. ed. 1974); H. Morris, *The Troubled Waters of Evolution* 111-142 (2d ed. 1982); H. Morris and G. Parker, *What is Creation Science?* 189, 235-39 (pub. sch. ed. 1982). Thus, Senator Keith's statement confirms that his conception of creation-science was nothing other than orthodox creation-science.

In sum, the legislators equated "creation-science" with orthodox creation-science. Their awareness of the potential unconstitutionality of the Act caused them to delete from the definition of "creation-science" the orthodox creation-science tenets, much as it caused them to lard their discussions with conclusory references to "secular purpose" and "academic freedom." But just as such references are inadequate to supply a secular purpose, so also a general awareness of a potential constitutional flaw is inadequate to change the meaning of a statutory term whose meaning is otherwise apparent.

B. The Abrupt-Appearance Construct Is Not a Sufficiently Well-Defined Alternative to Make It Plausible that the Louisiana Legislature Intended the Abrupt-Appearance Construct by the Term "Creation-Science"

Appellants contend that the concept of "abrupt appearance in complex form" is not only nonreligious but is also the "creation-science" alternative to evolution. That construct, however, fails to define a concrete alternative to evolution. Accordingly, it is implausible that the Louisiana legislature intended the Act to embody it, rather than orthodox creation-science.

The theory of biological evolution is itself constantly evolving in light of new evidence. Thus, while Darwin thought that the evolutionary change that produces new species occurred over millions of years in large populations, many modern scientists hypothesize that such change takes place over only a few hundreds or thousands of years in limited populations.[20] Those favoring a more rapid pace of evolutionary change are careful to emphasize that their disagreement concerns the proper elaboration of the evolutionary theory, not a choice between creation and evolution.[21]

[20] A popularized account of this refinement of the theory of evolution is presented in S. Gould, *The Episodic Nature of Evolutionary Change*, in The Panda's Thumb: More Reflections on Natural History 179 (1980).

[21] *See, e.g.*, Stebbins & Ayala, *The Evolution of Darwinism*, 253 Sci. Am. 72 (July 1985) ("At the outset it must be said that — unlike

Appellants and their affiants cite the works of various participants in this debate to support their view that "abrupt appearance" is a valid scientific theory.[22] Yet appellants never clarify what they mean by "abrupt." The scholars who use "abrupt" or "sudden" in this debate mean hundreds or thousands of years.[23] If by "abrupt" appellants mean "instantaneous," then they are quoting the authorities out of context.[24] If instead they mean "over only a few hundreds or thousands of years," then "abrupt appearance" is not an alternative to evolution but a part of it. But nothing in the legislative history remotely suggests that the Louisiana legislature sought to provide "balanced treatment" of *evolution* and evolution.

Neither appellants nor their affiants suggest that their definition of "creation-science" is generally accepted. More significantly, they cite no authority bearing on the critical question of whether the Louisiana legislature intended "creation-science" to carry this idiosyncratic meaning. The sterilized abrupt-appearance construct can only be understood as a post hoc invention, created for the purpose of defending this unconstitutional Act.

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attacks by creationists and other nonscientists — none of these challenges denies that evolutionary change occurs, that current species have descended from common ancestors or that Darwinian natural selection plays an important part in the process. The disputes are conflicts of degree and emphasis within a shared evolutionary outlook.")

[22] *E.g.*, Kenyon Affidavit at A-22 to A-25 (quoting S. Gould, *supra* note 20).

[23] *See* S. Gould, *supra* note 20, at 184:

> In describing the speciation of peripheral isolates as very rapid, I speak as a geologist. The process may take hundreds, even thousands of years; you might see nothing if you stared at speciating bees on a tree for your entire lifetime. But a thousand years is a tiny fraction of one percent of the average duration for most fossil invertebrate species — 5 to 10 million years. Geologists can rarely resolve so short an interval at all; we tend to treat it as a moment.

[24] *See* Cole, *Misquoted Scientists Respond*, 6 Creation/Evolution 34 (Fall 1981).

C. "Creation-Science" Is a Term of Art and Those Who Call Themselves Creation-Scientists Understand "Creation-Science" To Mean Orthodox Creation-Science

In construing a statute under constitutional attack, this Court has adhered to the "fundamental canon of statutory construction . . . that, unless otherwise defined, words will be interpreted as taking their ordinary, contemporary, common meaning." *Perrin* v. *United States*, 444 U.S. 37, 42 (1979) (citing *Burns* v. *Alcala*, 420 U.S. 575, 580-81 (1975)).[25] Last year, the Court reiterated its adherence to this canon, explaining that "deference to the supremacy of the legislature, as well as recognition that [legislators] typically vote on the language of a bill, generally require us to assume that 'the legislative purpose is expressed by the ordinary meaning of the words used.'" *United States* v. *Locke*, _____ U.S. _____, _____, 105 S. Ct. 1785, 1793 (1985) (quoting *Richards* v. *United States*, 369 U.S. 1, 9 (1962)).[26]

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[25] It may be suggested that this Court should rely upon a different canon of construction: that statutes should be construed so as to avoid constitutional issues. That canon offers no assistance in this case, however, because "resort to an alternative construction to avoid deciding a constitutional question is appropriate only when such a course is 'fairly possible' or when the statute provides a 'fair alternative' construction." *Swain* v. *Pressley*, 430 U.S. 377, 378 (1977). As Justice Cardozo wrote, "avoidance of a difficulty will not be pressed to the point of disingenuous evasion." *George Moore Ice Cream Co.* v. *Rose*, 289 U.S. 373, 379 (1933). *Accord Lewis* v. *United States*, 445 U.S. 55, 65 (1980). Given the abundance of support for the orthodox creation-science interpretation and the complete absence of support for the sterilized abrupt-appearance construct in the legislative record, adoption of the latter would reach the level of "disingenuous evasion." Moreover, in light of the plentiful evidence set forth in the appellees' brief that the Act has a primary religious purpose, regardless of its meaning, such a construction would not avoid the constitutional question.

[26] *See also* La. Civ. Code art. 14 ("The words of a law are generally to be understood in their most usual signification, without attending so much to the niceties of grammar rules as to the general and popular use of the words.").

"Creation-science," while not a term in common usage, nevertheless has a definite meaning.[27] It is a term of art describing the work of those who hold themselves out as "creation-scientists." The Louisiana Civil Code provides that "[t]erms of art . . . are to be interpreted according to their received meaning and acceptation with the learned in the art, trade or profession to which they refer." La. Civ. Code art. 15. Therefore, the best source of information as to the accepted meaning of "creation-science" is to examine what "creation-scientists" mean by it.

"Perhaps the leading creationist organization is the Institute for Creation Research (ICR)." *McLean*, 529 F. Supp. at 1259. In one of its books, ICR's Director explains:

> [T]he Institute has developed over 60 books, given lectures and messages in many hundreds of churches and on other hundreds of college and university campuses, conducted a weekly worldwide radio program, and participated in a wide variety of evangelistic and teaching ministries. Of greatest influence have been the creation-evolution debates between ICR scientists and leading evolutionary scientists. Almost 150 of these have been held to date (1982), usually before audiences numbering in the thousands. Since 1981 ICR has offered graduate degree programs in the sciences. Its worldwide impact has been far greater than can be attributed to its very limited size and resources, so its staff and supporters are convinced that God Himself is leading and using its work.

H. Morris, *The Troubled Waters of Evolution* 15-16 (2d ed. 1982).

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[27] "Creation," of course, *is* a term in common usage. It is used in the Act in the contexts of "scientific evidences for creation" and "creation-models." To the extent one may determine the "ordinary meaning" of words from the dictionary, it is significant that the primary definition is "the act of creating, especially the act of bringing into existence *from nothing* the universe or the living and nonliving things in it." Webster's Third International Dictionary 532 (1966) (emphasis added). As noted above, creation "from nothing" is part of orthodox creation-science.

Elsewhere in this brief, we canvass the books published by ICR and CRS. *See* notes 10-17 *supra*. As we show there, the universal understanding of "creation-science," as expressed by its leading practitioners, is orthodox creation-science. We have found no published book by any creation-scientist that defines "creation-science" as the sterilized abrupt-appearance construct urged by appellants in their brief.

D. This Court Should Defer to the Lower Courts' Construction of the Act

Both the District Court and the Court of Appeals in this case specifically held that the term "creation-science," as used in the Act, is a religious concept. One may infer from the references to "the Biblical account" in both opinions that both courts construed the term "creation-science" in the Act to mean orthodox creation-science. That construction of the statute is entitled to deference on appeal.

This Court has recently stated, "[n]ormally . . . we defer to the construction of a state statute given it by the lower federal courts." *Brockett* v. *Spokane Arcades*, _____ U.S. _____, _____, 105 S. Ct. 2794, 2800 (1985); *Pierson* v. *Ray*, 386 U.S. 547, 558 n.12 (1967). The Court's practice has been "to accept a reasonable construction of state law by the Court of Appeals 'even if an examination of the state-law issue without such guidance might have justified a different conclusion.'" *Haring* v. *Prosise*, 462 U.S. 306, 314 n.8 (1983) (quoting *Bishop* v. *Wood*, 426 U.S. 341, 346 (1976)). This practice reflects the Court's "belief that district courts and courts of appeals are better schooled in and more able to interpret the laws of their respective States." *Brockett*, _____ U.S. at _____, 105 S. Ct. at 2800 (1985). Since the interpretation of "creation-science" by the courts below was certainly not "clearly erroneous," *United States* v. *Durham Lumber*, 363 U.S. 522, 527 (1960), or "unreasonable," *Propper* v. *Clark*, 337 U.S. 472, 486-87 (1949), this Court should reject appellants' invitation to craft a new construction of Louisiana law.

II. By Requiring that Evolution Be Taught as a "Theory" While Permitting Other Scientific Hypotheses and Theories to Be Presented "As Proven Scientific Fact," the Act Demonstrates an Impermissible Preference for a Particular Religious Belief

The Establishment Clause, as incorporated in the Fourteenth Amendment, prohibits legislation if, "irrespective of government's actual purpose, the practice under review in fact conveys a message of endorsement or disapproval" of religion. *Wallace* v. *Jaffree*, _____ U.S. ____, _____ n.42, 105 S. Ct. at 2490 n.42 (quoting *Lynch* v. *Donnelly*, 465 U.S. 668, 690 (1984) (O'Connor, J., concurring)). The "message of endorsement or disapproval" conveyed by the Act is that evolutionary science should be subject to special criticism and challenge from which all other topics in science are spared. That message is embodied in the statutory requirement that "when evolution or creation is taught, each shall be taught as a theory, rather than as proven scientific fact." La. Rev. Stat. Ann. § 17.286.4.

In this section we shall explore the unmistakable religious bias reflected in the Act's "taught as a theory" requirement. By applying that requirement only to questions of "origins," the Louisiana legislature drew a scientifically untenable, pejorative distinction between evolutionary science and other scientific endeavors. A review of the process and vocabulary of science will confirm that the essence of a scientific "theory" does not vary from discipline to discipline. The Act's "fact-theory" distinction, which has no basis in science — but which reflects the belief system of certain fundamentalist sects — confirms that "fundamentalist sectarian conviction was and is the law's reason for existence." *Epperson* v. *Arkansas*, 393 U.S. 97, 108 (1968).[28]

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[28] Evolution has historically been "offensive to religious fundamentalists because the theory cannot be reconciled with the Biblical account of the origin of man." *Aguillard*, 765 F.2d at 1256. *Cf.* H. Morris, *The Troubled Waters of Evolution* 72-76 (2d ed. 1982) ("Satan himself is the originator of the concept of evolution").

Science is devoted to formulating and testing naturalistic explanations for natural phenomena. It is a process for systematically collecting and recording data about the physical world, then categorizing and studying the collected data in an effort to infer the principles of nature that best explain the observed phenomena.[29] Science is not equipped to evaluate supernatural explanations for our observations; without passing judgment on the truth or falsity of supernatural explanations, science leaves their consideration to the domain of religious faith. Because the scope of scientific inquiry is consciously limited to the search for naturalistic principles, science remains free of religious dogma and is thus an appropriate subject for public-school instruction.

The scientific community has developed a vocabulary to describe the various aspects of the scientist's work. Although individual scientists are not always careful in their use of that vocabulary, a rigorous set of definitions can help to prevent confusion about what a scientific theory is. It can also provide a firm base on which to discuss the legal issues presented in this case.

The grist for the mill of scientific inquiry is an ever-increasing body of observations that give information about underlying "facts." Facts are the properties of natural phenomena. The scientific method involves the rigorous, methodical testing of principles that might present a naturalistic explanation for those facts. To be a legitimate scientific "hypothesis," an explanatory principle must be consistent with prior and present observations and must remain subject to continued testing against future observations. An explanatory principle that by its nature cannot be tested is outside the realm of science.

The process of continuous testing leads scientists to accord a special dignity to those hypotheses that accumulate

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[29] *See IIT Research Institute* v. *United States*, 9 Cl. Ct. 13 (1985) (defining "science" as "the process by which knowledge is systematized or classified through the use of observation, experimentation, or reasoning").

substantial observational or experimental support. Such hypotheses become known as scientific "theories." If a theory successfully explains a large and diverse body of facts, it is an especially "robust" theory. If it consistently predicts new phenomena that are subsequently observed, it is an especially "reliable" theory. Even the most robust and reliable theory, however, is tentative. A scientific theory is forever subject to reexamination and — as in the case of Ptolemaic astronomy — may ultimately be rejected after centuries of viability.

Every scientific discipline embraces a body of facts and one or more theories to explain them. Significantly for this case, scientific facts and theories are not interchangeable: An explanatory principle is not to be confused with the data it seeks to explain. This relationship between scientific theory and fact permeates all scientific disciplines; it unifies the enterprise of all scientists, from astronomers to zoologists.

A thorough scientific education should introduce these concepts about the hierarchy of scientific ideas. Such an introduction would permit the student to relate the substantive findings of science to the process of science. Just as children should understand and appreciate the scientific theories that offer the most robust and reliable naturalistic explanations of the universe, children should also understand and appreciate the essentially tentative nature of science. In an ideal world, every science course would include repeated reminders that each theory presented to explain our observations of the universe carries this qualification: "as far as we know now, from examining the evidence available to us today."[30]

The Louisiana legislature chose a different path. Instead of requiring that schoolchildren be educated about the *uniformly* tentative nature of science, the Louisiana legislature drew a false and misleading distinction among scientific disciplines. By restricting its "taught as a theory" mandate to the matter of "origins," the Act implicitly tells Louisiana's

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[30] Contrast this ideal with the CRS members' "statement of belief" quoted at page 10 *supra*. It would be difficult to imagine a scientist signing a comparable statement concerning Darwin's *Origin of Species*.

schoolchildren that while most of what they learn in science class is "proven scientific fact," evolution is not. Indeed, by juxtaposing the unmodified word "theory" with the twice-modified word "fact," the statute suggests that evolutionary theory is a particularly flimsy sort of theory. Not "proven" or "scientific," but speculative and baseless.[31]

The Act's false dichotomy between "origins" and all other scientific concepts not only invites students to mistake all those other concepts for "proven facts"; it actively deprecates evolution. By so doing, the Act grossly misrepresents the status of evolutionary theory within the universe of scientific theories. The evolutionary history of organisms has been as extensively tested and as thoroughly corroborated as any biological concept. *E.g.*, E. Mayr, *Populations, Species and Evolution* 1 (1970) ("The theory of evolution is quite rightly called the greatest unifying theory in biology."); National Academy of Sciences, *Science and Creationism* 14-22 (1984); P. Kitcher, *Abusing Science: The Case Against Creationism* 54 (1983); Dobzhansky, *Nothing in Science Makes Sense Except in the Light of Evolution*, 35 American Biology Teacher 125 (1973).

The Act thus singles out evolutionary theory for more disparaging treatment than other scientific theories that are actually no more robust and reliable. It encourages teachers to erroneously label the proposition that tides are caused by the gravitational attractions of the sun and moon, for example, a "proven scientific fact," while labeling the proposition that species evolve through time a mere "theory." The reason for this scientifically indefensible legislative posture is clear: Whereas the reason for tides is not an issue of significance to adherents of certain religions, evolution is.

The Act's requirement that creation-science, as well as evolution, be "taught as theory" does not ameliorate the Act's

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[31] The absence of "scientific" as a modifier to "theory" is particularly revealing. It suggests that the word "theory" may have been intended in its colloquial sense of pure conjecture or speculation. Webster's Third International Dictionary 2371 (1966).

religiously motivated hostility to evolution. Even if the Act had embodied the sterilized abrupt-appearance construct set forth by appellants in this litigation,[32] it would still have singled out one topic in science ("origins") for special, disparaging treatment because the prevailing theory of "origins" (evolutionary theory) conflicts with religious dogma.

The conclusion is clear: the Act, however construed, is structured "to convey a message that religion or a particular religious belief is favored or preferred." *Jaffree*, _____ U.S. at _____, 105 S. Ct. at 2497 (O'Connor, J., concurring). Scientists do not single out "origins" for characterization as a "theory." Holders of a particular religious belief do.

[32] Obviously, if the term "creation-science" means the religious dogma of orthodox creation-science as we demonstrate in Part I above, the constitutional flaw is compounded: the statute both requires an untestable religious belief to be taught as a scientific theory and imposes special restrictions on science education for religious reasons.

CONCLUSION

For the foregoing reasons, the judgment of the Court of Appeals should be affirmed.

Respectfully submitted,

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